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RESPONSE TO "COMPARISON OF BUTTERFLY DIVERSITY IN THE NEOTROPICAL AND ORIENTAL REGIONS" BY ROBERT K. ROBBINS

Robbins' review of Heppner (1991) utilizes one exceedingly small piece of the work (i.e., paragraph 4 on page 4 and Table 4) as a platform to criticize the purpose and logic of the entire study. In doing so, he misses the broader view of the paper—comparisons of Lepidoptera diversity, distribution, and endemism throughout the world. Robbins uses his knowledge of butterflies (15% of the Lepidoptera) to criticize the results of my studies based on all families of Lepidoptera.

Robbins' major criticism focuses on my conclusions regarding species richness. Obviously, taking any small area of the world (like Massachusetts) and using the resultant skewed figures for *extrapolated* species richness comparison is an absurd exercise, and this forms the basis of his criticism. Although Robbins is correct that I am not comparing areas of *equal* size (even areas of equal size may not be comparable because of shape), I am evaluating areas of *comparable* size, i.e., large continental masses of several million square miles. It is clearly stated in my work that the species richness values represent "species per million square miles."

Robbins uses relatively small areas like southeast Peru (Tambopata Reserve) and Rondonia (Brazil) as examples to imply that all the Neotropics are vastly more species rich than the Oriental Region, ignoring the immense Patagonian Plains, the extensive high Andean regions, and the desert regions of Chile and Mexico, where species diversity is very low. If samples from these localities were incorporated into Robbins' species/area regression, they likely would change the regression line and invalidate many of his conclusions. My species/area values are averaged over the total continental landmasses involved. Robbins even corroborates my calculations that there are more species per million square miles in the smaller Oriental Region (6782) than in the vast Neotropical Region (6434). These figures do not diminish the importance of preserving species-rich areas in the Neotropics (I clearly indicate that "the Neotropical region has many more species than any other faunal region"), they only highlight the conservation needs of the much more deforestation-pressured Oriental areas.

Robbins also criticizes my species numbers for butterflies, relying primarily on other published numbers (i.e., Ehrlich & Raven 1965, Robbins 1982, Shields 1989, Brown 1991). He fails to recognize that estimates presented in these works chronologically approach the numbers I presented, i..e, together, previously published estimates of species numbers present a well defined trend in which the estimates increase chronologically along with our increased knowledge of the groups involved. Further, Robbins does not take into account the numbers of species to be described in the future.

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